

STEREO INTEGRATED AMPLIFIER

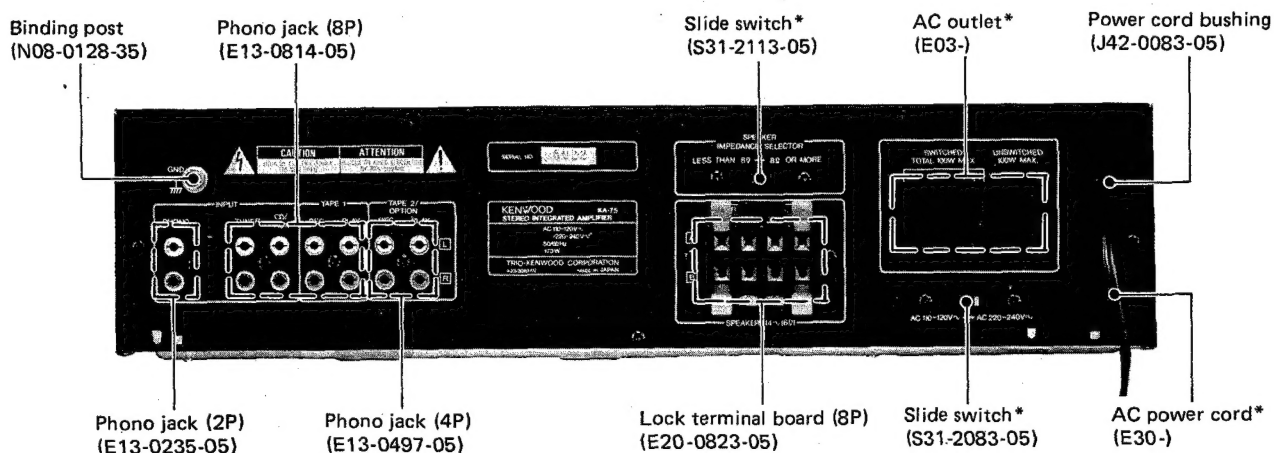
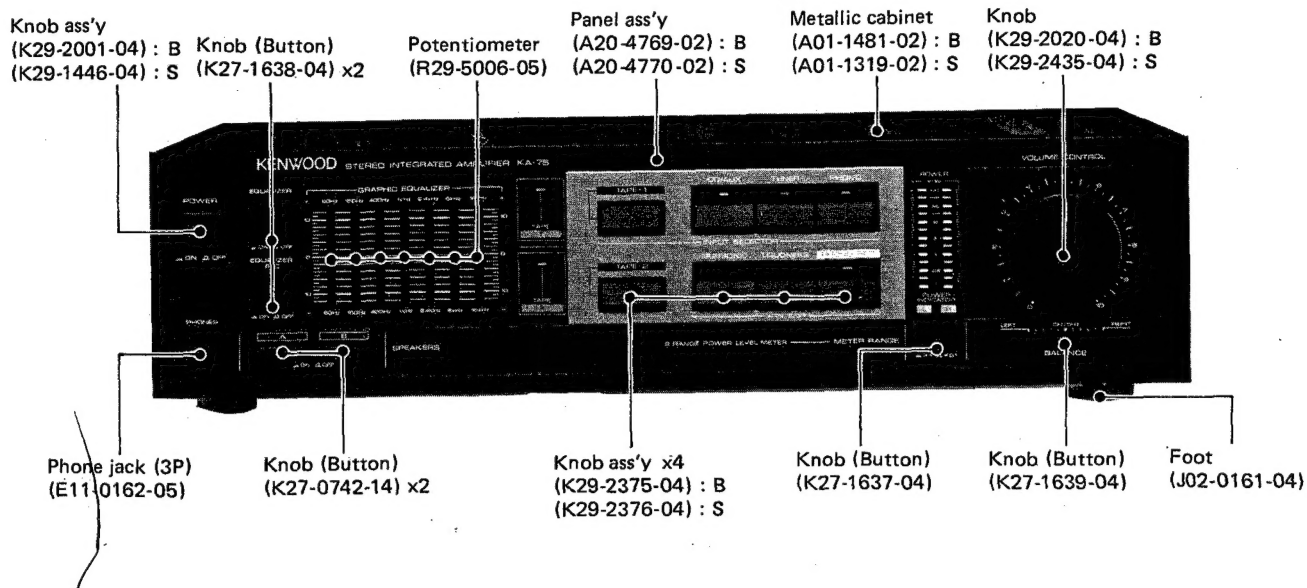
KA-75

SERVICE MANUAL

KENWOOD

TRIO-KENWOOD CORPORATION

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B51-1929-00(O)1475

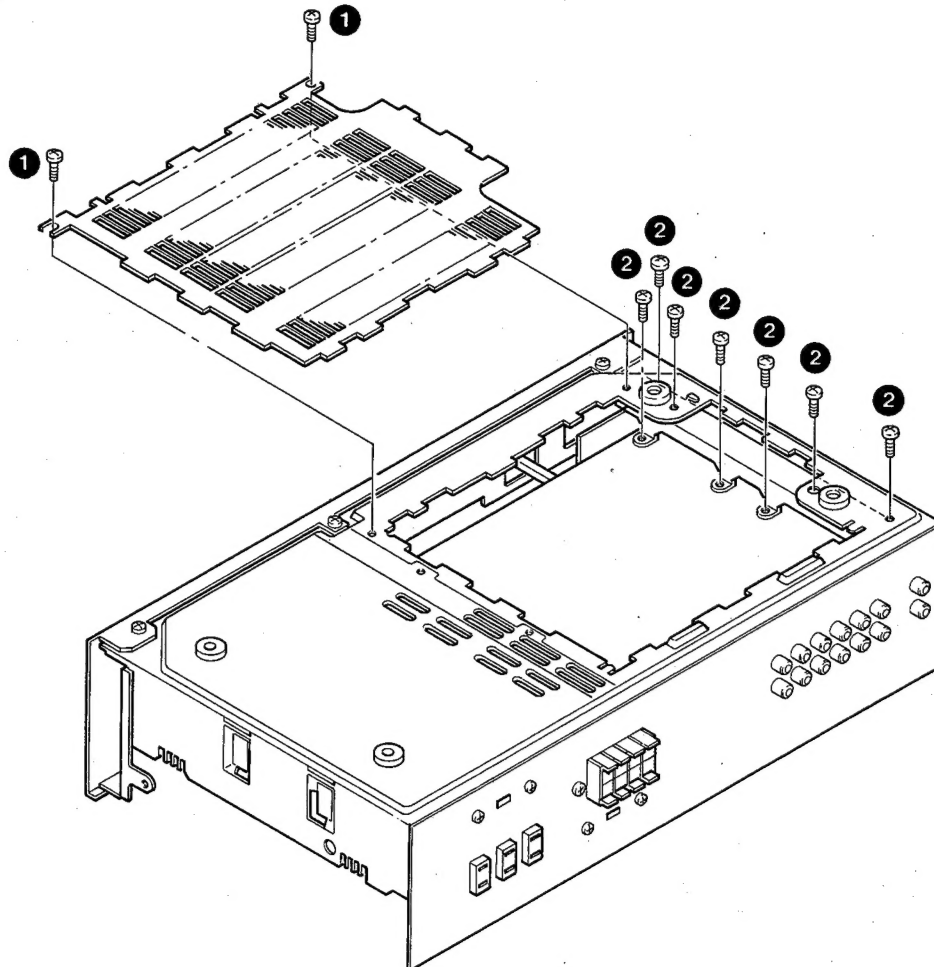


*Refer to parts list on page 8.
Refer to specifications on page 5.
Photo is KA-75 (Black version).
S : Silver version.
B : Black version.

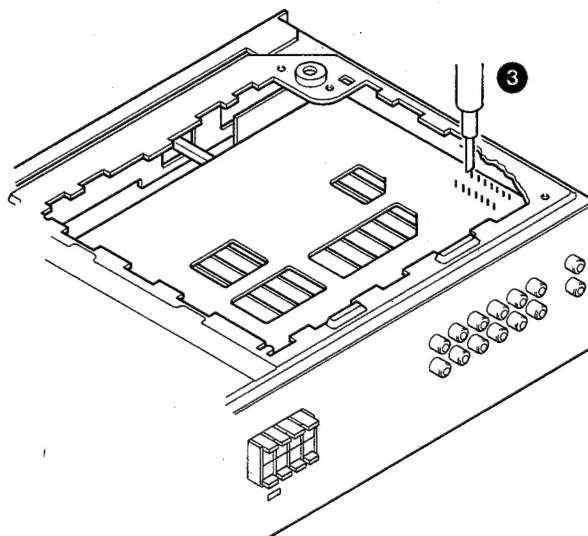
DISASSEMBLY FOR REPAIR

The soldering iron does not reach IC1 (X09-) even if the bottom plate is removed, thus remove the left-hand frame.

1. Remove the 2 screws (**1**) to remove the bottom plate.
2. Remove the 7 screws (**2**) from the frame, and remove the frame taking care of the claws.



3. Solder IC1 (X09-) (**3**).



CIRCUIT DESCRIPTION

Description of components

AUDIO (X09-2280-10)

Components	Application/Function	Operation/Condition/Compatibility
Q1, Q2	For muting	Driven by IC1 of X13-5350-10 and turned on when the input is changed or PHONO REC SW is operated. Interchangeable 2SD1302(S).
Q3~Q6	Final driver	
Q7~Q10	Final	Interchangeable models of these ones are 2SA1106 and 2SC2581. These have aluminum internal lead wires, while above interchangeable ones have gold wires. Tips of both groups are the same.
Q11, Q12	Portection (Detection of current)	Since detection level is affected by dispersion of h_{FE} , a transistor at too high level cannot be used. At present, short-circuiting with output of about 2V can turn on protection. If sensitivity is too high, protection may works because of inductance of speaker when output is large.
Q13, Q14	For protection of BIAS	There are no interchangeable models.
Q15, Q16	For driving meter	Constant-current transistor operated by DC voltage obtained by detecting and rectifying output voltage. Interchangeable with common transistors.
Q17, Q18	Current mirror for driving meter LED of 4~6 points	Interchangeable with common transistors.
Q19	AVR (+ side)	Interchangeable with TO-220 in 40~50W class.
Q20	AVR (- side)	Interchangeable with TO-220 in 40~50W class.
Q21	Constant voltage for class A amplifier	Resistance to high voltage is necessary.
Q22, Q23	Protection	A thyristor is composed of Q22 and Q23. Thus, if protection works, they cannot be reset unless power switch is turned off temporarily. Interchangeable with common transistors.
Q24, Q25	For driving C-MOS for PHONO REC	See explanation of operation of circuit Interchangeable with common transistors.
Q26	For driving MUTE for PHONO REC	See explanation of operation of circuit. Interchangeable with common transistors.

TONE (X11-2250-10)

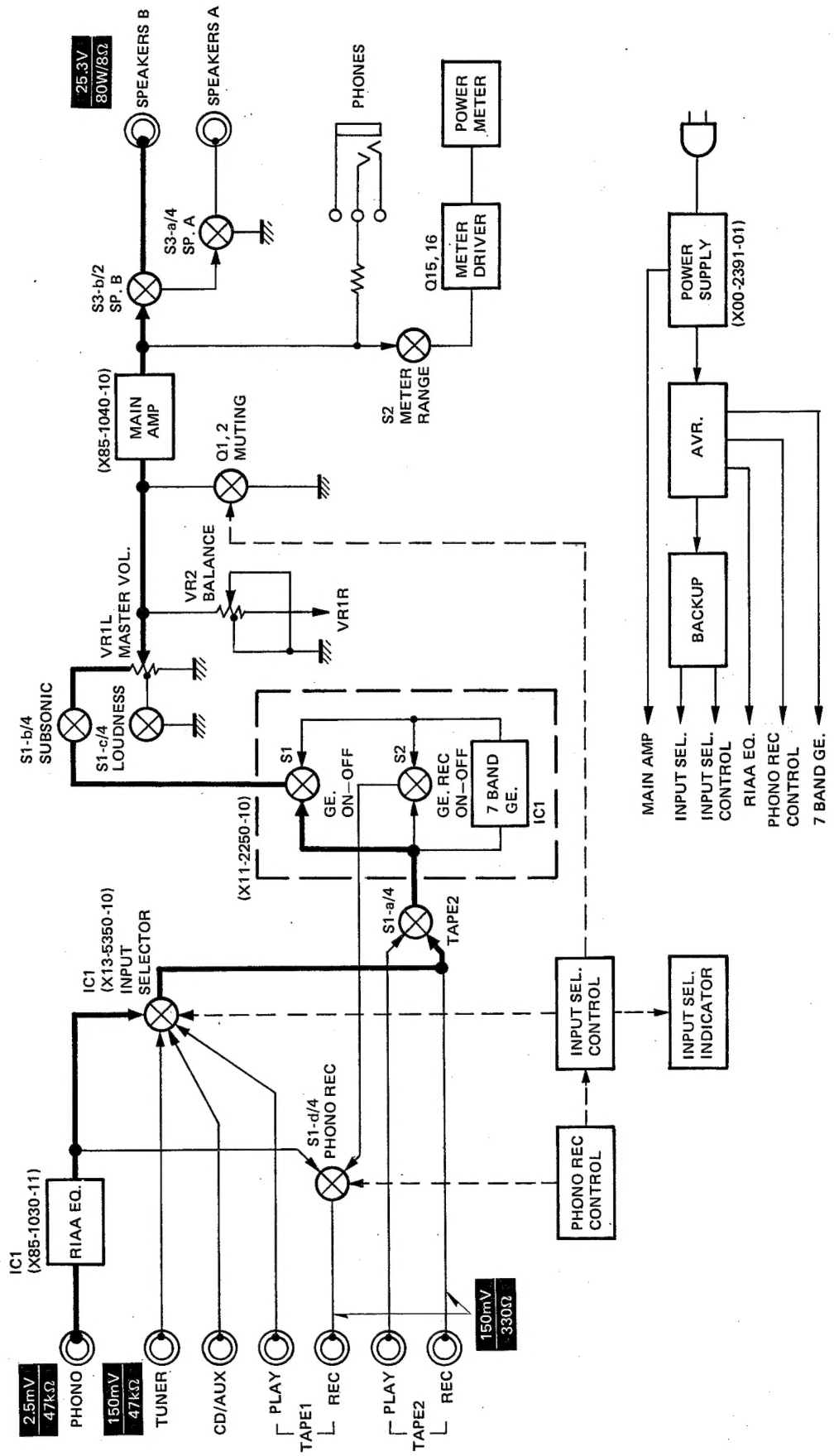
Components	Application/Function	Operation/Condition/Compatibility
IC1, IC2	IC for 7 band graphic equalizer	Circuit supplied by manufacture is input composition type, but output composition type is used considering noises.

SWITCH (X13-5350-10)

Components	Application/Function	Operation/Condition/Compatibility
D1~D10	Electrostatic protection	Used to protect IC1 from outside voltage higher than source voltage. MA177 etc. or combination of multipurpose diodes may be used.
D11	For protection of inverse current of backup capacitor	Any one may be used.
D12	For preventing voltage drop caused by D11	Any one may be used.
Q1	For initializing	See explanation of operation of circuit. Common transistor may be used, but it must have h_{FE} of about 100. If it is too high, backup period will be long.
IC1	C-MOS for input selector	Pins of this model is compatible with LC7815H, but latter cannot be used, since its withstand voltage is low.

RXC
256

BLOCK LEVEL DIAGRAM



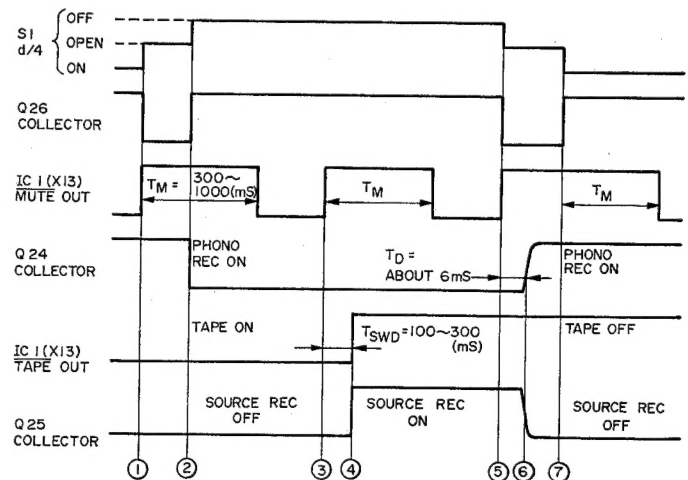
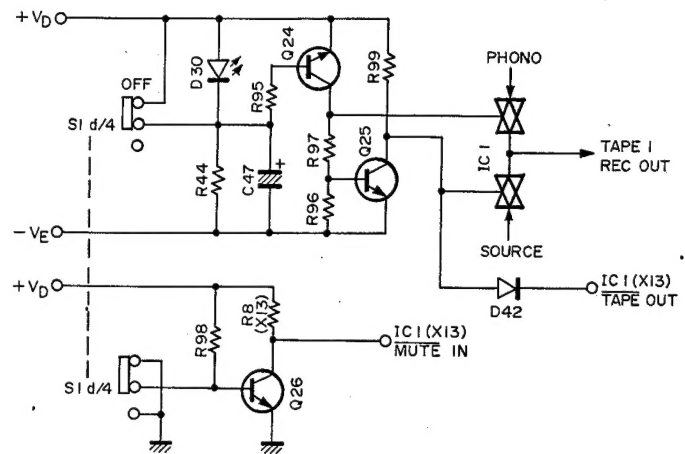
CIRCUIT DESCRIPTION

PHONO REC Circuit (X09-2280-10)

The PHONO REC circuit of KA-75 is switched remotely by the C-MOS IC (IC1 : LC4966) for the effective use of space and higher performance. Therefore, this circuit controls the IC1 and prevents shock noises, too. Q26 in the lower part of the circuit at right above generates the muting signals and drives the $\overline{\text{MUTE}}$ in of IC1 (LC7816) of X13-5350-10.

The operation of each section will be explained below referring to the flow chart given at left below. If the selector is at TAPE1, and REC SW is turned on, Q24 and Q25 are turned on, and IC1 (X13-) TAPE out is set to low ($-V_E$ level).

1. If the contact is removed to turn off the PHONO REC SW (S1 d/4), the current flows through R98 to the base of Q26. As the result, Q26 is turned on, and $\overline{\text{MUTE}}$ in terminal of IC1 (X13-) is set to low, and IC1 (X13-) outputs the MUTE out. The time to perform this operation is 300~1,000 msec.
2. The contact on off side of S1 comes in contact to turn off Q24 and Q25 are switch the IC1 to source side. However, the selector is at TAPE and IC1 (X13-) TAPE out is at low, the collector of Q25 is set to low, thus both IC1's are turned off.
3. If the selector SW is set to a position other than TAPE, IC1 (X13-) outputs the MUTE out.
4. IC1 (X13-) switches the LED output TSWD (100~200 msec) after receiving the switching signal, thus the TAPE out is set to HI. Since Q25 has been turned off, IC1 turns on the source side.
5. If the contact is removed again to turn on PHONO REC SW (S1 d/4), Q26 is turned on at first similarly to step 1., and IC1 (X13-) MUTE out is output. At the same time, C47 is charged through the base of Q24 and R95.
6. After a certain time T_D (about 6 msec) which is a time constant determined by R94, R95 and C47, Q24 and Q25 are turned on, and IC1 is switched to the phone side. Time T_D is also the time from start of muting to switching, and it may be shortened because of the dispersion of the timing of S1 d/4, thus it should be longer. However, if the capacity of C47 is increased to lengthen this time, Q24 is turned on softly, thus shock noises is increased.
7. If the contact on ON side of S1 d/4 comes in contact, Q26 is turned off and the MUTE in is set to HI, and IC1 (X13-) keeps the $\overline{\text{MUTE}}$ out at HI position from the point of this time for T_M .



CIRCUIT DESCRIPTION/ADJUSTMENT

Initializing Circuit (X13-5350-10)

The input selector IC (IC1) is backed up by D11 and C1 but IC1 (LC7816) cannot keep the current position when VDD is below 3V. Therefore, the TUNER must be selected forcibly before this occurs.

Fig.1 shows the initializing circuit for the above operation, and Fig. 2 and Fig. 3 show the voltage at various points in that circuit. If the backup voltage is V, the terminal voltage VC of capacitor C2 is also V. If the power is turned on at this time, transistor Q1 is turned on for the time determined by R5, R6 and C2, and its output VO becomes a pulse of time width of T. Fig. 2 shows the operation with V low, and Fig. 3 shows the operation with V high. If T is 100~300 msec or wider, IC1 assumes it to be an input and turns the position to TUNER.

As explained above, the backup period is determined by the operating point of this circuit, and the lower the R5/R6 is, the longer the backup period is. However, if R5/R6 is too low, the output of VO becomes 0 even if V is 3V, and the position cannot be fixed. At present, the initializing is performed when V is 4~6V. This dispersion is caused by the ambient temperature and hFE of Q1. That is, when the ambient temperature is high or hFE is high, the voltage at which the initializing starts is high and the backup period is short.

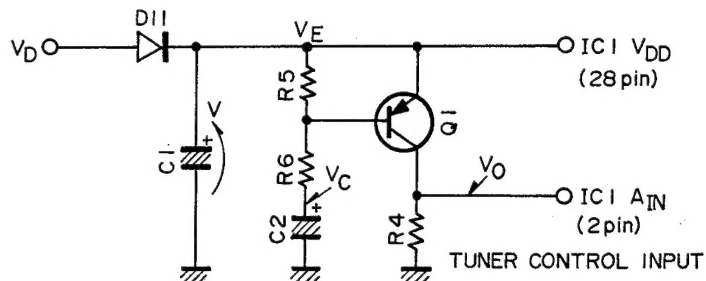


Fig. 1

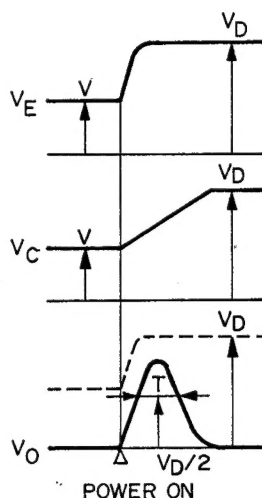


Fig. 2

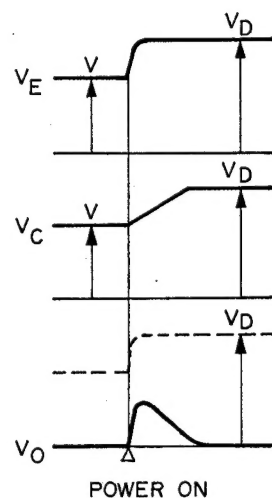


Fig. 3

ADJUSTMENT

Other models

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	IDLE CURRENT (1)	—	Connect a DC voltmeter across CP1 (L) CP2 (R)	VOLUME: 0 S8:4Ω	VR3 (L) VR4 (R)	3mV	(a)
2	IDLE CURRENT (2)	—	Connect a DC voltmeter across CP1 (L) CP2 (R)	VOLUME: 0 S8:8Ω	VR3 (L) VR4 (R)	Less than 30mV	(a)

U.S.A. and CANADA models

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	IDLE CURRENT	—	Connect a DC voltmeter across CP1 (L) CP2 (R)	VOLUME: 0	VR3 (L) VR4 (R)	10mV	(a)

REGLAGE/ABGLEICH

SPECIFICATIONS

REGLAGE

Autres modèles

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINS L'ALIGNEMENT	ALIGNER POUR	FIG.
1	COURANT DE POLARISATION (1)	—	Connecter un voltmètre de CC sur CP1 (G) CP2 (D)	VOLUME: 0 S8:4Ω	VR3 (G) VR4 (D)	3mV	(a)
2	COURANT DE POLARISATION (2)	—	Connecter un voltmètre de CC sur CP1 (G) CP2 (D)	VOLUME: 0 S8:8Ω	VR3 (G) VR4 (D)	moins de 30mV	(a)

ETATS-UNIS d'AMERIQUE et CANADA modèles

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINS L'ALIGNEMENT	ALIGNER POUR	FIG.
1	COURANT DE POLARISATION	—	Connecter un voltmètre de CC sur CP1 (G) CP2 (D)	VOLUME: 0	VR3 (G) VR4 (D)	10mV	(a)

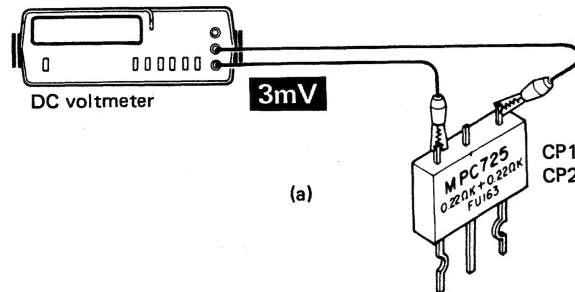
ABGLEICH

Andere model

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	VERSTÄRKER EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
1	LEERLAUFSTROM (1)	—	Einen Gleichspannungsmesser über CP1 (L) CP2 (R) anschließen.	VOLUME: 0 S8:4Ω	VR3 (L) VR4 (R)	3mV	(a)
2	LEERLAUFSTROM (2)	—	Einen Gleichspannungsmesser über CP1 (L) CP2 (R) anschließen.	VOLUME: 0 S8:8Ω	VR3 (L) VR4 (R)	Weniger als 30mV	(a)

Amerika und KANADA

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	VERSTÄRKER EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
1	LEERLAUFSTROM	—	Einen Gleichspannungsmesser über CP1 (L) CP2 (R) anschließen.	VOLUME: 0	VR3 (L) VR4 (R)	10mV	(a)



Power Amplifier Section

Power Output

80 watts* per channel minimum RMS, both channels driven, at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.09% total harmonic distortion

Both Channels Driven into
8 ohms at 1,000 Hz 85 W + 85 W (Except U.S.A., Europe and U.K.)
4 ohms at 1,000 Hz 78 W + 78 W (Except U.S.A., Europe and U.K.)
Music Power Output (8 ohms) 145 W + 145 W (Except U.S.A., Europe and U.K.)

Total Harmonic Distortion
AUX → SPKR (8 Ω)/ Power in → SPKR (8 Ω)
(20 Hz to 20,000 Hz)
At Rated Output 0.09%
At 1/2 Rated Output 0.05%
(1,000 Hz)
At 1/2 Rated Output 0.005%
Phono → SPKR (8 Ω)/ At -20 dB Volume Level
(1,000 Hz)
At Rated Output 0.04%
Intermodulation Distortion (60 Hz : 7,000 Hz = 4 : 1)
At Rated Output 0.02% into 8 ohms
Damping Factor 30 (50 Hz)
Frequency Response
Overall (AUX → SPKR) 10 Hz to 70,000 Hz, +0 dB, -3 dB
Phono "RIAA" Response
(Phono → REC out) 30 Hz to 20 Hz, ±0.5 dB
Power Bandwidth 10 Hz to 50,000 Hz
0.2% T.H.D. 8 ohms

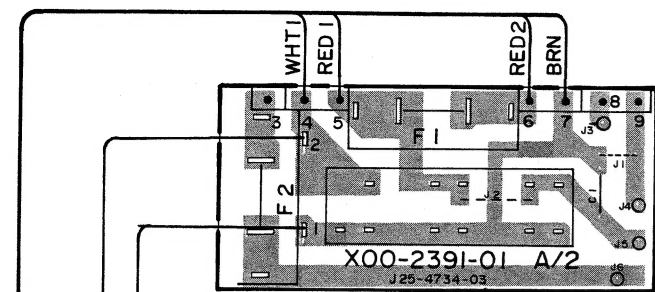
Input Sensitivity/Impedance
Phono MM 2.5 mV/ 47 k ohms
Tuner, AUX., Tape Play 150 mV/ 33 k ohms
Signal-to-Noise Ratio (IHF-A)
Phono MM 75 dB at 2.5 mV
Phono MM 81 dB at 5.0 mV
Tuner, AUX., Tape Play 100 dB
Phono Maximum Input Level
MM 150 mV (Phono to Tape REC), 0.05% T.H.D. at 1,000 Hz

Output Level/Impedance
Tape REC (Pin) 150 mV/ 330 ohms
Tone Control
60 Hz, 150 Hz, 400 Hz, 1,000 Hz, 2,400 Hz, 6,000 Hz, 15,000 Hz ±10 dB
Filter
Subsonic 60 Hz, 6 dB/ oct
Loudness Control
At -30 dB Volume Level +8 dB at 100 Hz
General
Power Supply Voltage, Frequency 120 V, 60 Hz (U.S.A. and Canada models), 220 V, 50 Hz (Europe model), 240 V, 50 Hz (U.K. model), 110 ~ 120 V/ 220 ~ 240 V, 50/ 60 Hz (Other countries)
Power Consumption 2.5 A (U.S.A. and Canada models), 170 W (Other countries)
AC Outlet
Switched 100 W
Unswitched 100 W
Dimensions W 420 mm
H 109 mm
D 282 mm
Weight
Net 6.6 kg
Gross 7.4 kg

*Measured pursuant to Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifier in U.S.A..
Note :
We follow a policy of continuous advancements in developments. For this reason specifications may be changed without notice.

KA-75 KA-75

PC BOARD



POWER SUPPLY (X00-2391-01) Foil side view

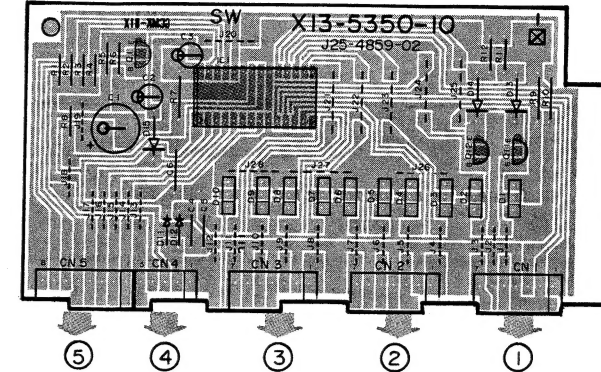
X13-5350-10

Q1	B	C	E
15.4V	0V	0V	15.5V

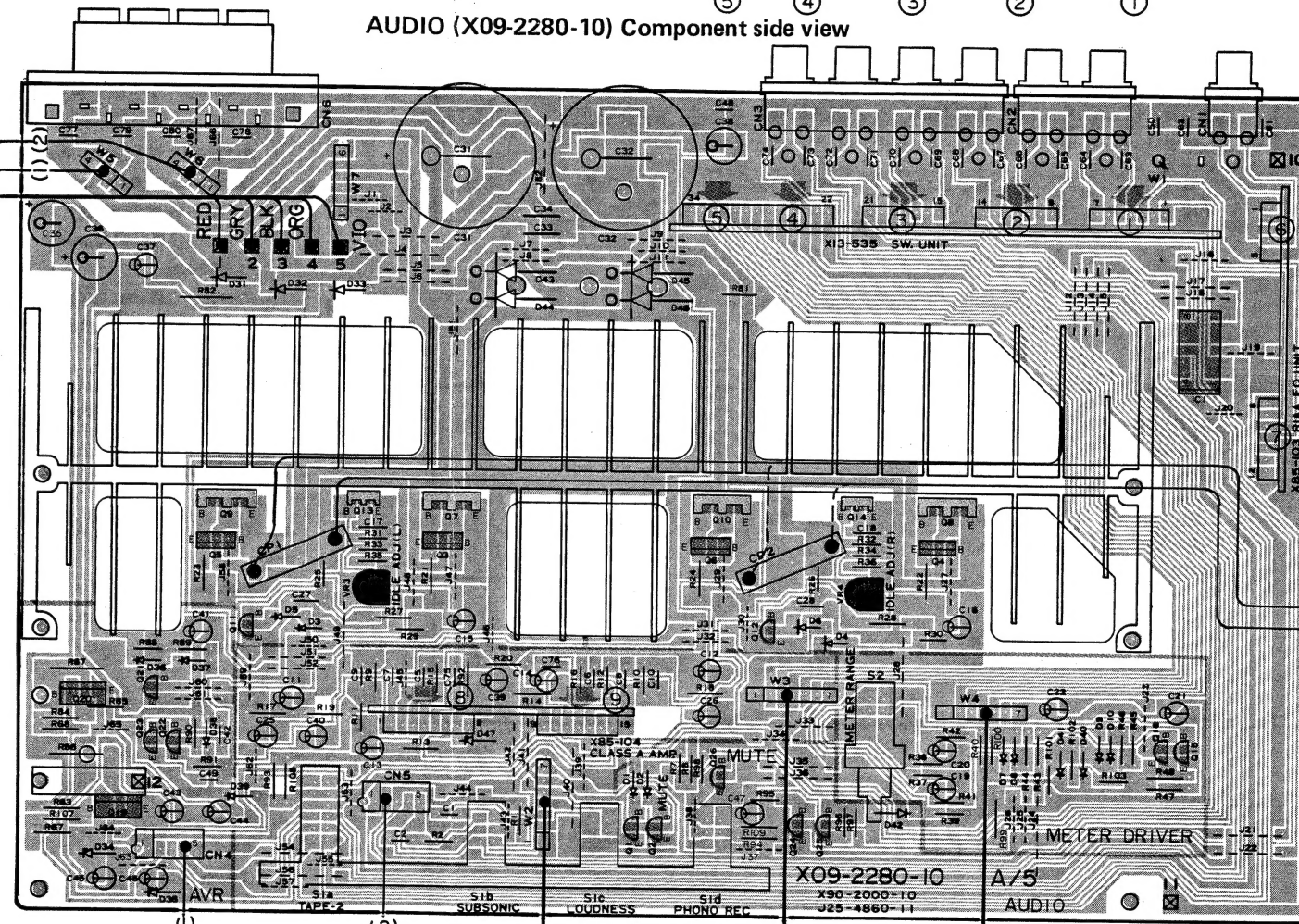
IC1

1	15.0V	21	0V
2-5	0V	22	15.5V
6	0V	23	-16.0V
7	15.5V	24	15.5V
8	15.5V	25, 26	0V
9-19	0V	27	-15.9V
20	-16.0V	28	15.5V

SWITCH (X13-5350-10) Component side view



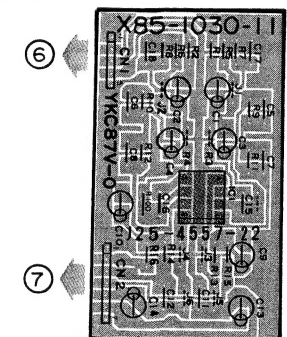
AUDIO (X09-2280-10) Component side view



X09-2280-10

	B	C	E
Q1, Q2	0V (0.7V) *2	0V	0V
Q3, Q4	1.1V (0.7V)	56.2V (46.7V)	0.6V (0V)
Q5, Q6	-1.1V (0.7V)	-56.2V (-46.7V)	-0.6V (0V)
Q7, Q8	0.6V (0V)	56.2V (46.7V)	0V
Q9, Q10	-0.6V (0V)	-56.2V (-46.7V)	0V
Q11, Q12	0V	47.3V (39.2V)	0V
Q13, Q14	-0.5V (0.7V)	1.1V (0.7V)	-1.1V (0.7V)
Q15, Q16	0.4V (0V)	14.1V (0V)	0V
Q17, Q18	15.8V (1.0V)	0V	14.2V (0V)
Q19	16.4V (1.6V)	42.1V (44.3V)	16.2V (1.1V)
Q20	-16.2V	-36.5V (39.2V)	16.0V
Q21	47.6V (39.5V)	56.3V (46.8V)	47.0V (38.9V)
Q22	47.7V (39.5V)	0V (0.8V)	47.7V (39.5V)
Q23	0V (0.8V)	47.7V (39.5V)	0V
Q24	16.2V (15.6V) *3 (1.1V)	-15.8V (16.2V) *3 (-15.8V)	16.2V (1.1V)
Q25	-16.0V (-15.4V) *3	15.3V *4 (-16.0V) *3	0V
Q26	0V (0.7V) *1	15.8V (0V) *1	0V

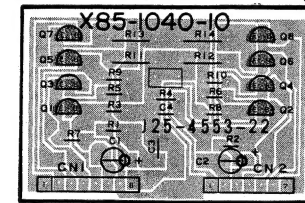
*1 : PHONO REC ON
*2 : PHONO REC or SELECTOR ON
*3 : PHONO REC ON
*4 : PHONO REC OFF TAPE-1 ON
() : PROTECTION WORKS
() : S8 = 4Ω



PRE AMP (X85-1030-11) Component side view

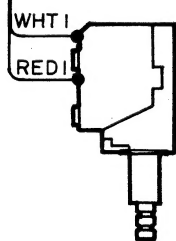
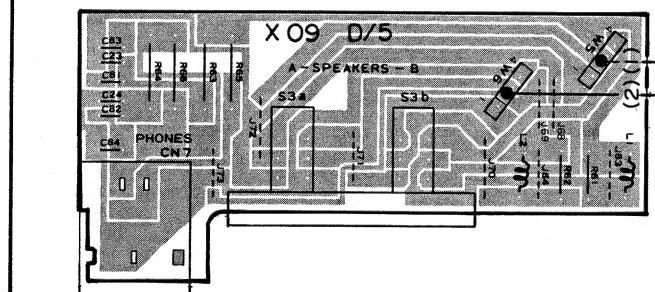
Component side view

PRE AMP (X85-1040-10)



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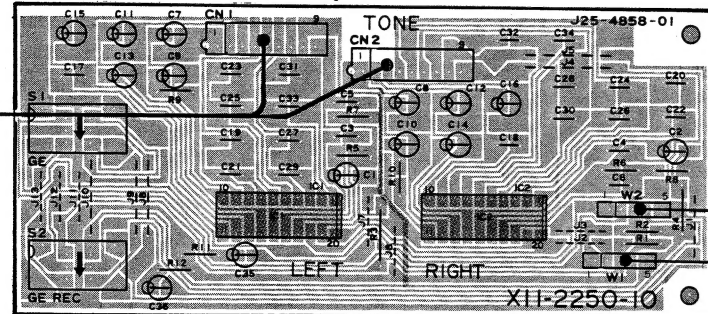


FRONT

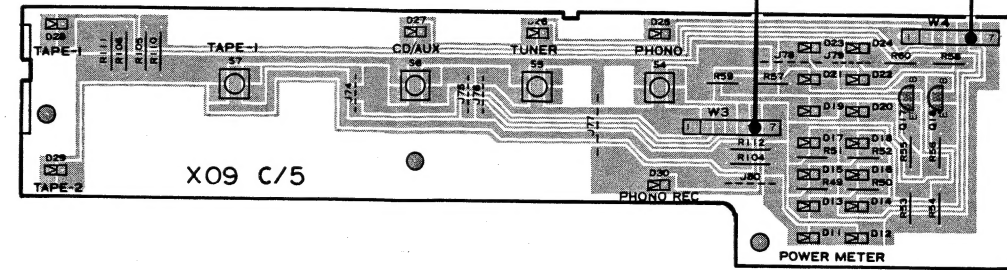
X11-2250-10
IC1, 2

1-17	0V
18	15.8V
19	0V
20	-16V

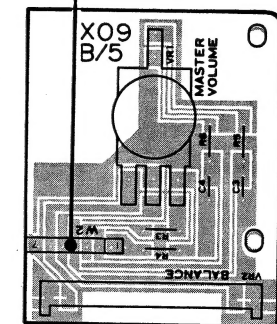
TONE (X11-2250-10) Component side view



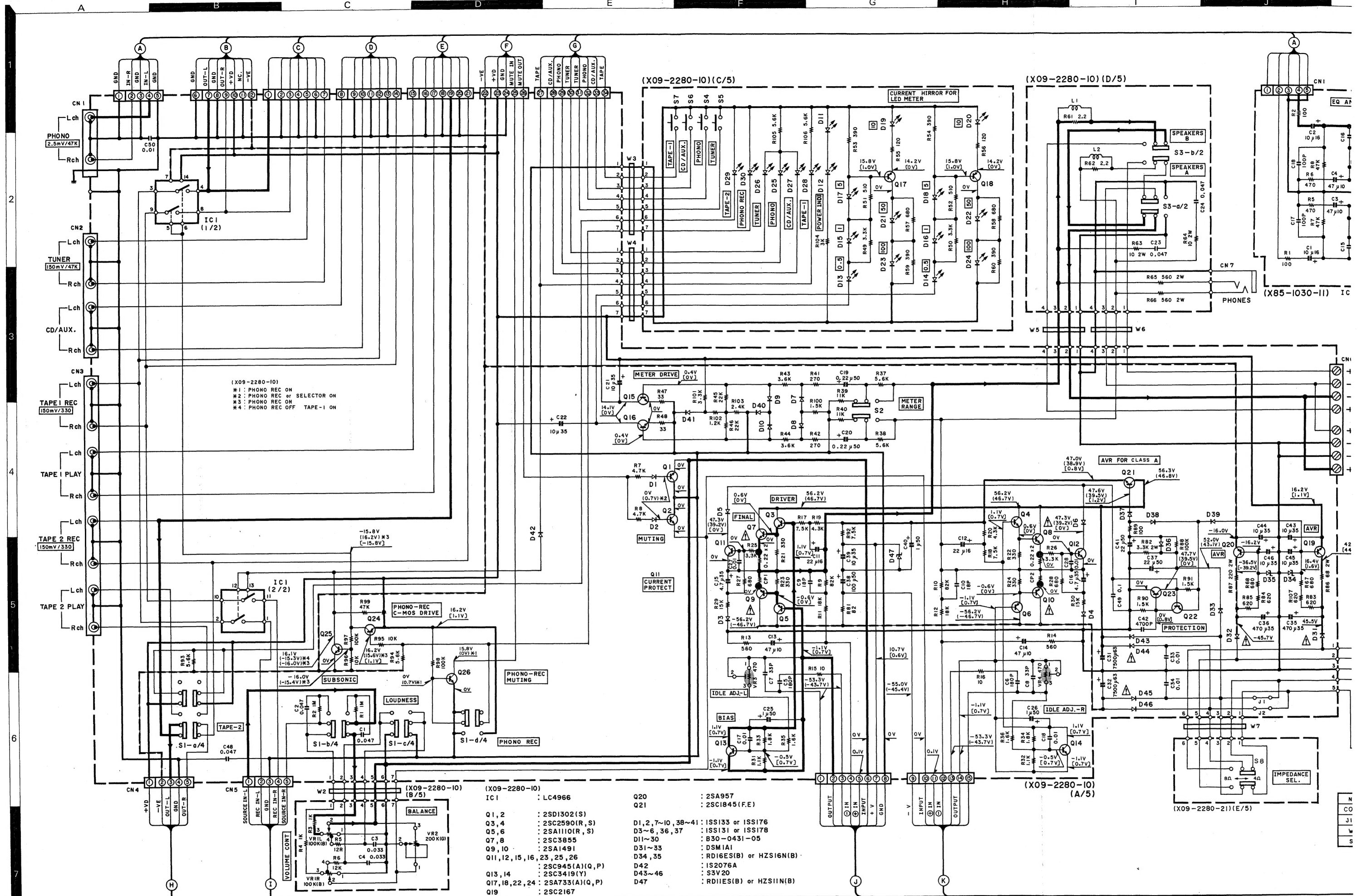
GRAPHIC EQUALIZER (R29-5006-05)

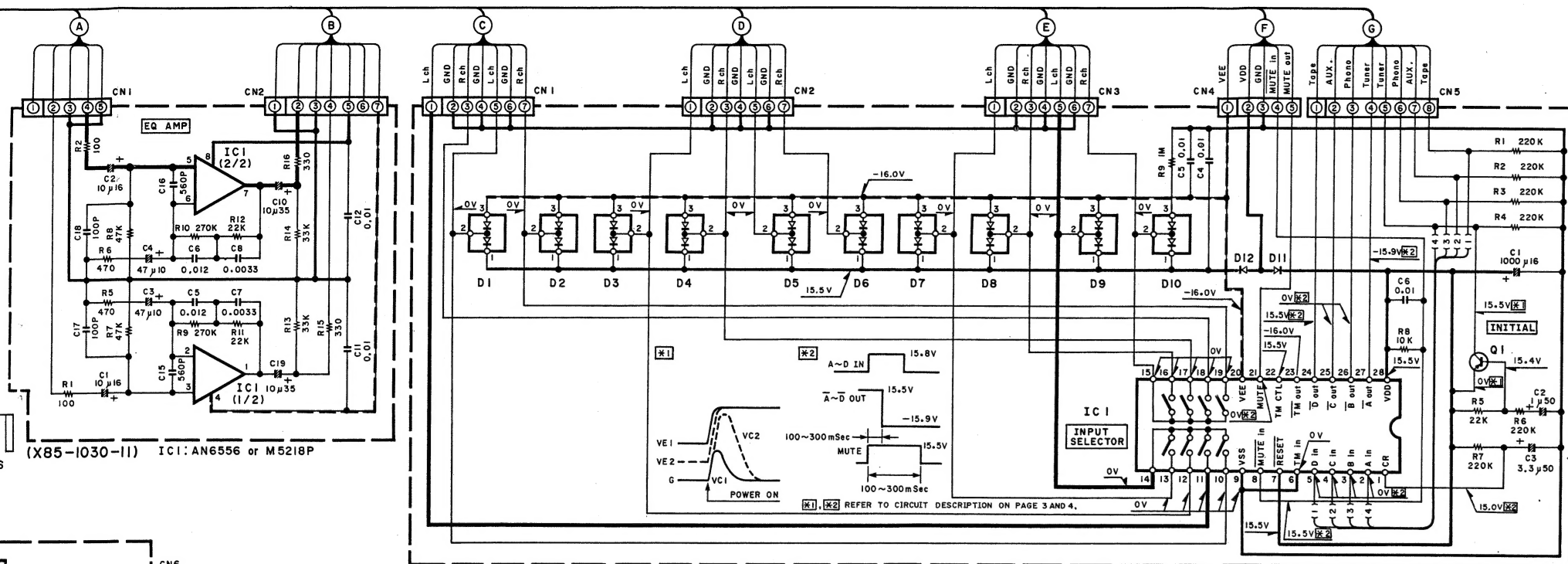


X09 C/5

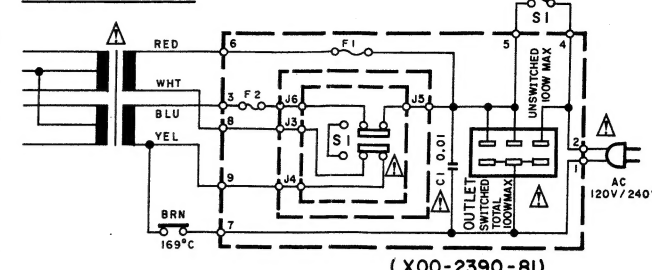


X09 B/5

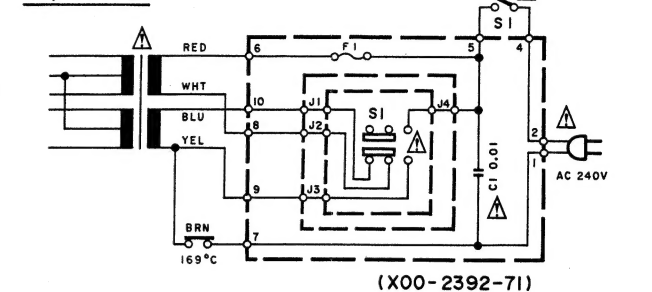




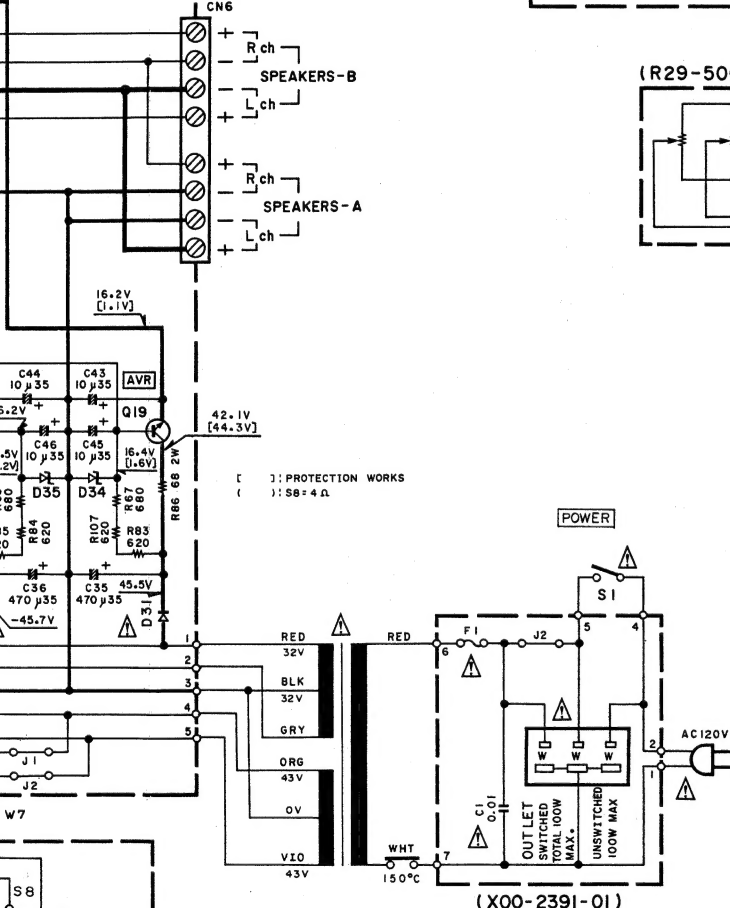
(U, M, UE) TYPE



(A, X) TYPE

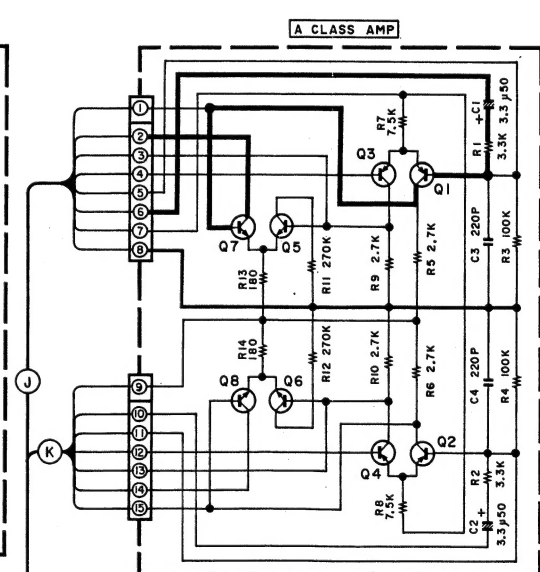
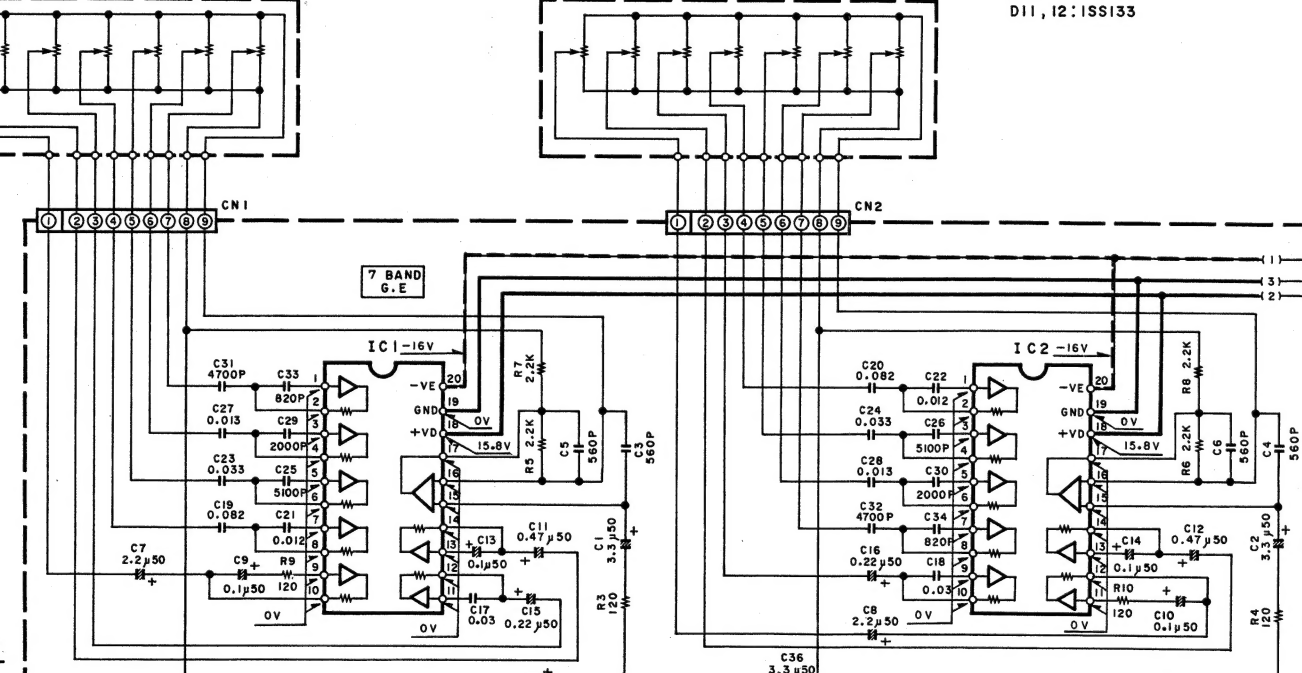


SWITCH UNIT (X13-5350-10)
 IC1 : LC7816
 Q1 : 2SA733(A)(Q)
 DI~10 : MA156
 DI1, I2 : ISS133



(R29-5006-05)

(R29-5006-05)

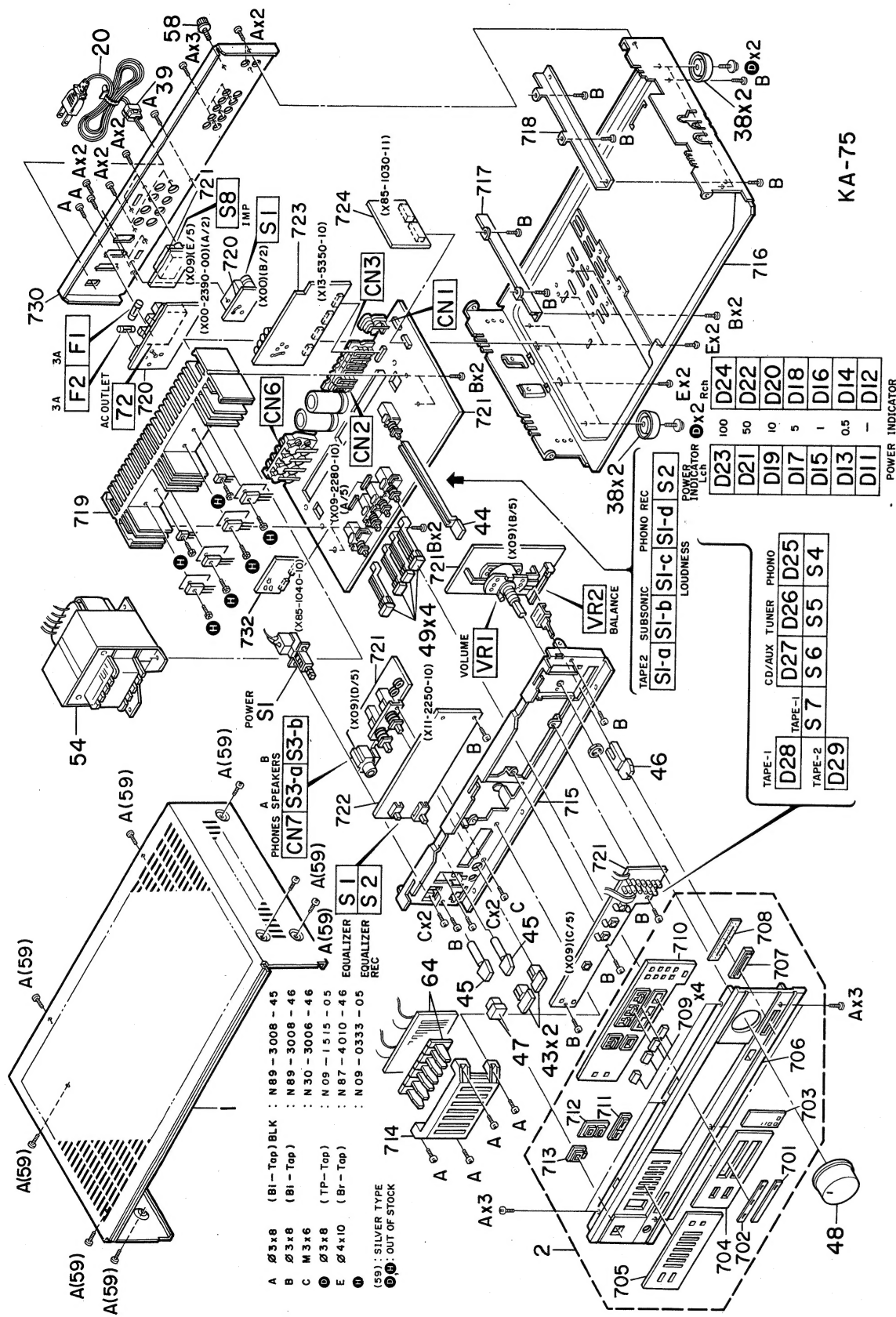


- 2SA733(A) 2SC945(A)
- 2SA992 2SD1302
- 2SC1845
- 2SA1110 2SC2590
- 2SA957 2SC2167
- 2SA1491 2SC3855
- 2SC3419
- M5229P
- AN6556 M5218P
- LC7816
- LC4966

CAUTION : For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Δ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

• DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

EXPLODED VIEW



Parts with the exploded numbers larger than 700 are not supplied.

PARTS LIST

* New Parts

Parts without Parts No. are not supplied.

Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

Ref. No.	Address	New Parts	Parts No.	Description	Destination	Remarks
参照番号	位置	新	部品番号	部品名 / 規格	仕向	備考
KA-75						
1	1A		A01-1319-02	METALLIC CABINET	M2A2	
1	1A		A01-1481-02	METALLIC CABINET	KPUM1	
1	1A		A01-1481-02	METALLIC CABINET	XA1UE	
2	2A	*	A20-4769-02	PANEL ASSY	KPUM1	
2	2A	*	A20-4769-02	PANEL ASSY	XA1UE	
2	2A	*	A20-4770-02	PANEL ASSY	M2A2	
			B46-0092-03	WARRANTY CARD	K	
			B46-0094-03	WARRANTY CARD	UUE	
			B46-0095-03	WARRANTY CARD	UUE	
			B46-0096-13	WARRANTY CARD	X	
			B46-0121-03	WARRANTY CARD	P	
		*	B50-6104-00	INSTRUCTION MANUAL (ENGLISH)		
		*	B50-6105-00	INSTRUCTION MANUAL (FRENCH)	PM1M2X	
		*	B50-6105-00	INSTRUCTION MANUAL (FRENCH)	A1A2	
		*	B50-6106-00	INSTRUCTION MANUAL (SPANISH)	M1M2	
		*	B50-6106-00	INSTRUCTION MANUAL (SPANISH)	A1A2	
		*	B50-6107-00	INSTRUCTION MANUAL (ARABIC)	A1A2	
		*	B50-6107-00	INSTRUCTION MANUAL (ARABIC)	M1M2	
			B58-0223-04	CAUTION CARD (PRE-SET 120V)	U	
			B58-0269-04	CAUTION CARD	KA1A2	
			B58-0513-04	CAUTION CARD (PRESET220-240)	UE	
			B59-0092-00	SERVICE DIRECTORY	UUE	
△	20	1C	E30-0459-05	AC POWER CORD	A1A2	
△	20	1C	E30-0812-05	AC POWER CORD	UM1UE	
△	20	1C	E30-0812-05	AC POWER CORD	M2	
△	20	1C	E30-0974-05	AC POWER CORD	KP	
△	20	1C	E30-1341-05	AC POWER CORD	X	
△	F1	1C	F05-2525-05	FUSE (SEMKO) (250V T2.5A)	X	
△	F1	1C	F06-5022-05	FUSE (UL) (250V 5A)	KP	
△	F1	1C	F05-2521-05	FUSE (250V 2.5A)	UM1UE	
△	F1	1C	F05-2521-05	FUSE (250V 2.5A)	M2	
△	F1	1C	F05-2525-05	FUSE (SEMKO) (250V T2.5A)	A1A2	
			G11-0163-04	SOFT TAPE (40X20X20)		
		*	H01-7109-04	ITEM CARTON CASE	KPUM1	
		*	H01-7109-04	ITEM CARTON CASE	UE	
		*	H01-7109-04	ITEM CARTON CASE	XA1	
		*	H01-7174-04	ITEM CARTON CASE	M2A2	
			H10-3317-02	POLYSTYRENE FOAMED FIXTURE		
		*	H11-0002-04	POLYSTYRENE FOAMED BOARD		
			H25-0223-04	PROTECTION BAG (750X350)		
			H25-0232-04	PROTECTION BAG (235X350)		
38	2B, 2C		J02-0161-04	FOOT		
39	1C		J42-0083-05	POWER CORD BUSHING		
			J61-0307-05	WIRE BAND		
43	2A		K27-0742-14	KNOB (BUTTON) SPEAKERS		
44	1B	*	K27-1637-04	KNOB (BUTTON) METER		
45	2A	*	K27-1638-04	KNOB (BUTTON) GE		
46	2B	*	K27-1639-04	KNOB (BUTTON) BALANCE		
47	2A		K29-1446-04	KNOB ASSY POWER	M2A2	
47	2A		K29-2001-04	KNOB ASSY POWER	KPUM1	

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47	2A		K29-2001-04	KN0B ASSY POWER	UE	
47	2A		K29-2001-04	KN0B ASSY POWER	XA1	
48	2A		K29-2020-04	KN0B VOLUME	KPUM1	
48	2A		K29-2020-04	KN0B VOLUME	UE	
48	2A		K29-2020-04	KN0B VOLUME	XA1	
48	2A	*	K29-2435-04	KN0B VOLUME	M2A2	
49	1B	*	K29-2375-04	KN0B ASSY TAPE	KPUM1	
49	1B	*	K29-2375-04	KN0B ASSY TAPE	UE	
49	1B	*	K29-2375-04	KN0B ASSY TAPE	XA1	
49	1B	*	K29-2376-04	KN0B ASSY TAPE	M2A2	
△ 54	1B	*	L01-7041-05	POWER TRANSFORMER	KP	
△ 54	1B	*	L01-7045-05	POWER TRANSFORMER	UM1UE	
△ 54	1B	*	L01-7045-05	POWER TRANSFORMER	XM2	
△ 54	1B	*	L01-7045-05	POWER TRANSFORMER	A1A2	
58	1C		N08-0128-35	BINDING POST (GND)		
59	1A		N09-1473-05	TAPPING SCREW (M3X8) CASE	M2A2	
D	2C		N09-1515-05	TAPPING SCREW (3X8)		
64	1A		R29-5006-05	POTENTIOMETER (GE)		
△ S1	1B		S40-1073-05	PUSH SWITCH		
POWER SUPPLY (X00-2391-01)						
△ C1			C91-0023-05	CERAMIC 0.01UF AC250V	UM1UE	
△ C1			C91-0023-05	CERAMIC 0.01UF AC250V	M2	
△ C1			C91-0647-05	CERAMIC 0.01UF P	KPX	
△ C1			C91-0647-05	CERAMIC 0.01UF P	A1A2	
△ 72	1C	*	E03-0077-05	AC OUTLET	UM1UE	
△ 72	1C	*	E03-0077-05	AC OUTLET	M2	
△ 72	1C	*	E03-0078-05	AC OUTLET	KP	
-			J13-0041-05	FUSE CLIP	KPUM1	
-			J13-0041-05	FUSE CLIP	UEM2	
-			J13-0054-05	FUSE CLIP	XA1A2	
-			J61-0307-05	WIRE BAND	XA1A2	
△ S1	1C		S31-2083-05	SLIDE SWITCH (POWER TYPE)	UM1UE	
△ S1	1C		S31-2083-05	SLIDE SWITCH (POWER TYPE)	A1A2M2	
AUDIO (X09-2280-10)						
D11 -30	2B,2C		B30-0431-05	LED(LN21CPH)		
C1 ,2			CF92FV1H473J	MF 0.047UF J		
C3 ,4			CF92FV1H333J	MF 0.033UF J		
C5 ,6			CC45FSL1H181J	CERAMIC 180PF J		
C7 ,8			CC45FSL1H330J	CERAMIC 33PF J		
C9 ,10			CC45FSL1H180J	CERAMIC 18PF J		
C11 ,12			CE04KW1C220M	ELECTRO 22UF 16WV		
C13 ,14			CE04KW1A470M	ELECTRO 47UF 10WV		
C15 ,16			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C17 ,18			C91-0769-05	CERAMIC 0.01UF M		
C19 ,20			CE04KW1HR22M	ELECTRO 0.22UF 50WV		
C21 ,22			CE04KW1V100M	ELECTRO 10UF 35WV		
C23 ,24			CK45FF1H473Z	CERAMIC 0.047UF Z		
C25 ,26			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C27 ,28			C91-0769-05	CERAMIC 0.01UF M		
C31 ,32			C90-1317-05	ELECTRO 7500UF 63WV		
C33 ,34			CK45FE2H103P	CERAMIC 0.010UF P		

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C35 ,36			CE04KW1V471M	ELECTRO 470UF 35WV		
C37			CE04KW1H220M	ELECTRO 22UF 50WV		
C38			CE04KW1H101M	ELECTRO 100UF 50WV		
C39			CE04KW1V100M	ELECTRO 10UF 35WV		
C40			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C41			CE04KW1H220M	ELECTRO 22UF 50WV		
C42			CF92FV1H472J	MF 4700PF J		
C43 -46			CE04KW1V100M	ELECTRO 10UF 35WV		
C48			CK45FF1H473Z	CERAMIC 0.047UF Z		
C49			CF92FV1H104J	MF 0.10UF J		
C50			CK45FF1H103Z	CERAMIC 0.010UF Z		
CN1	1C		E13-0235-05	PHONE JACK (2P)PHONE		
CN2	1B		E13-0497-05	PHONE JACK (4P)TUNER/CD		
CN3	1C		E13-0814-05	PHONE JACK (8P)TAPE		
CN6	1C		E20-0823-05	LOCK TERMINAL BOARD(8P)SP		
CN7	1B		E11-0162-05	PHONE JACK (3P)PHONES		
L1 ,2			L39-0085-05	PHASE-COMPENSATION COIL		
H	1B		N09-0333-05	TAPPING SCREW (3X12)		
CP1 ,2			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R21 -24			RD14AB2E331J	FL-PROOF RD 330 J 1/4W		
R61 ,62			RD14AB2E2R2J	FL-PROOF RD 2.2 J 1/4W		
R63 ,64			RS14DB3D100J	FL-PROOF RS 10 J 2W		
R65 ,66			RS14DB3D561J	FL-PROOF RS 560 J 2W		
R81			RD14AB2E820J	FL-PROOF RD 82 J 1/4W		
R82			RS14DB3D332J	FL-PROOF RS 3.3K J 2W		
R86			RS14DB3D680J	FL-PROOF RS 68 J 2W		
R87			RS14DB3D221J	FL-PROOF RS 220 J 2W		
VR1	2B	*	RD6-5151-05	POTENTIOMETER(100K B)VOLUME		
VR2	2B	*	R13-5080-05	POTENTIOMETER(200K G)BALANCE		
VR3 ,4			R12-0094-05	TRIMMING POT. (470) BIAS		
S1	1B	*	S42-4048-05	MULTIPLE PUSH SWITCH(SELECTOR)		
S2	1B		S40-2193-05	PUSH SWITCH (METER RANGE)		
S3	1B	*	S42-2138-05	MULTIPLE PUSH SWITCH(SPEAKERS)		
S4 -7	2B		S40-1064-05	PUSH SWITCH		
S8	1C		S31-2113-05	SLIDE SWITCH (IMPEDANCE)	UM1UEX	
S8	1C		S31-2113-05	SLIDE SWITCH (IMPEDANCE)	A1A2M2	
D1 ,2			1SS133	DIODE		
D1 ,2			1SS176	DIODE		
D3 -6			1SS131	DIODE		
D3 -6			1SS178	DIODE		
D7 -10			1SS133	DIODE		
D7 -10			1SS176	DIODE		
△ D31 -33		*	DSM1A1	DIODE		
D34 ,35		*	HZS16N(B)	ZENER DIODE		
D34 ,35		*	RD16ES(B)	ZENER DIODE		
D36 ,37			1SS131	DIODE		
D36 ,37			1SS178	DIODE		
D38 -41			1SS133	DIODE		
D38 -41			1SS176	DIODE		
D42			1S2076A	DIODE		
△ D43 -46			S3V20	DIODE		

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D47 D47 IC1 Q1 ,2 Q3 ,4		*	HZS11N(B) RD11ES(B) LC4966 2SD1302(S) 2SC2590(R,S)	ZENER DIODE ZENER DIODE IC(CMOS LOGIC BILATERAL SW) TRANSISTOR TRANSISTOR		
Q5 ,6 Q7 ,8 Q9 ,10 Q11 ,12 Q13 ,14		*	2SA1110(R,S) 2SC3855 2SA1491 2SC945(A)(Q,P) 2SC3419(Y)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q15 ,16 Q17 ,18 Q19 Q20 Q21		*	2SC945(A)(Q,P) 2SA733(A)(Q,P) 2SC2167 2SA957 2SC1845(F,E)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q22 Q23 Q24 Q25 ,26		*	2SA733(A)(Q,P) 2SC945(A)(Q,P) 2SA733(A)(Q,P) 2SC945(A)(Q,P)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
TONE (X11-2250-10)						
C1 ,2 C3 -6 C7 ,8 C9 ,10 C11 ,12			CE04KW1H3R3M CK45FB1H561K CE04KW1H2R2M CE04KW1H0R1M CE04KW1HR47M	ELECTRO 3.3UF 50WV CERAMIC 560PF K ELECTRO 2.2UF 50WV ELECTRO 0.1UF 50WV ELECTRO 0.47UF 50WV		
C13 ,14 C15 ,16 C17 ,18 C19 ,20 C21 ,22			CE04KW1H0R1M CE04KW1HR22M CF92FV1H303J CF92FV1H823J CF92FV1H123J	ELECTRO 0.1UF 50WV ELECTRO 0.22UF 50WV MF 0.030UF J MF 0.082UF J MF 0.012UF J		
C23 ,24 C25 ,26 C27 ,28 C29 ,30 C31 ,32			CF92FV1H333J CF92FV1H512J CF92FV1H133J CF92FV1H202J CF92FV1H472J	MF 0.033UF J MF 5100PF J MF 0.013UF J MF 2000PF J MF 4700PF J		
C33 ,34 C35 ,36			CK45FB1H821K CE04KW1H3R3M	CERAMIC 820PF K ELECTRO 3.3UF 50WV		
S1 ,2 IC1 ,2	1B	*	S40-2351-05 M5229P	PUSH SWITCH (GE) IC(7CH GRAPHIC EQUALIZER)		
SWITCH (X13-5350-10)						
C1 C2 C3 C4 -6			CE04KW1C102M CE04KW1H010M CE04KW1H3R3M C91-0769-05	ELECTRO 1000UF 16WV ELECTRO 1.0UF 50WV ELECTRO 3.3UF 50WV CERAMIC 0.01UF M		
D1 -10 D11 ,12 IC1 Q1		*	MA156 1SS133 LC7816 2SA733(A)(Q)	DIODE DIODE IC TRANSISTOR		
PRE AMP (X85-1030-11)						
C1 ,2 C3 ,4 C5 C6			CE04FW1C100M CE04FW1A470M CF92FV1H123J CF92FV1H123J	ELECTRO 10UF 16WV ELECTRO 47UF 10WV MF 0.012UF J MF 0.012UF J		

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PRE AMP (X85-1040-10)						
C1 ,2 C3 ,4 R11 ,12 R13 ,14 Q1 -4 Q5 -8			CE04FW1H3R3M CC45FSL1H221J RD14AB2E271J RD14AB2E181J 2SA992(F,E) 2SC1845(F,E)	ELECTRO 3.3UF 50WV CERAMIC 220PF J FL-PROOF RD 270 J 1/4W FL-PROOF RD 180 J 1/4W TRANSISTOR TRANSISTOR		

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SPECIFICATION :

Refer to specifications on page 5.

Note :

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the U.S.A. (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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